Project 1

######### Question 1############  
setwd("~/5310 Project 1")  
dat <- read.csv("weather-2021.csv", check.names = F)  
dim(dat)

## [1] 255 22

head(dat)

## Date Minimum temperature (°C) Maximum temperature (°C) Rainfall (mm)  
## 1 JAN 2021-01-1 14.4 19.7 0.0  
## 2 JAN 2021-01-2 13.0 22.3 0.0  
## 3 JAN 2021-01-3 15.7 26.7 5.8  
## 4 JAN 2021-01-4 14.6 24.8 7.2  
## 5 JAN 2021-01-5 14.1 28.0 5.4  
## 6 JAN 2021-01-6 13.0 24.7 0.2  
## Evaporation (mm) Sunshine (hours) Direction of maximum wind gust   
## 1 NA NA ESE  
## 2 NA NA E  
## 3 NA NA NNW  
## 4 NA NA WNW  
## 5 NA NA NW  
## 6 NA NA ESE  
## Speed of maximum wind gust (km/h) Time of maximum wind gust  
## 1 35 12:39  
## 2 37 16:02  
## 3 31 13:28  
## 4 56 13:28  
## 5 39 13:16  
## 6 46 13:23  
## 9am Temperature (°C) 9am relative humidity (%) 9am cloud amount (oktas)  
## 1 15.9 71 8  
## 2 16.9 59 8  
## 3 17.9 94 8  
## 4 21.6 74 7  
## 5 19.2 77 4  
## 6 18.2 68 8  
## 9am wind direction 9am wind speed (km/h) 9am MSL pressure (hPa)  
## 1 SE 17 1021.7  
## 2 E 7 1015.7  
## 3 <NA> Calm 1008.1  
## 4 W 6 1006.3  
## 5 W 9 1008.0  
## 6 SE 11 1014.0  
## 3pm Temperature (°C) 3pm relative humidity (%) 3pm cloud amount (oktas)  
## 1 18.5 59 8  
## 2 20.6 60 8  
## 3 24.1 60 8  
## 4 16.3 97 8  
## 5 26.6 41 2  
## 6 19.1 76 7  
## 3pm wind direction 3pm wind speed (km/h) 3pm MSL pressure (hPa)  
## 1 ESE 17 1019.1  
## 2 E 17 1011.7  
## 3 NW 17 1005.8  
## 4 SSW 13 1007.6  
## 5 NW 20 1006.2  
## 6 ESE 33 1013.4

str(dat)

## 'data.frame': 255 obs. of 22 variables:  
## $ : chr "JAN" "JAN" "JAN" "JAN" ...  
## $ Date : chr "2021-01-1" "2021-01-2" "2021-01-3" "2021-01-4" ...  
## $ Minimum temperature (°C) : num 14.4 13 15.7 14.6 14.1 13 8.3 8.2 7.1 10.7 ...  
## $ Maximum temperature (°C) : num 19.7 22.3 26.7 24.8 28 24.7 24.3 22.2 27.7 31.8 ...  
## $ Rainfall (mm) : num 0 0 5.8 7.2 5.4 0.2 0 0 0 0 ...  
## $ Evaporation (mm) : logi NA NA NA NA NA NA ...  
## $ Sunshine (hours) : logi NA NA NA NA NA NA ...  
## $ Direction of maximum wind gust : chr "ESE" "E" "NNW" "WNW" ...  
## $ Speed of maximum wind gust (km/h): int 35 37 31 56 39 46 44 39 31 37 ...  
## $ Time of maximum wind gust : chr "12:39" "16:02" "13:28" "13:28" ...  
## $ 9am Temperature (°C) : num 15.9 16.9 17.9 21.6 19.2 18.2 16.6 15.5 17.3 19.9 ...  
## $ 9am relative humidity (%) : int 71 59 94 74 77 68 57 61 61 60 ...  
## $ 9am cloud amount (oktas) : int 8 8 8 7 4 8 NA 8 NA NA ...  
## $ 9am wind direction : chr "SE" "E" NA "W" ...  
## $ 9am wind speed (km/h) : chr "17" "7" "Calm" "6" ...  
## $ 9am MSL pressure (hPa) : num 1022 1016 1008 1006 1008 ...  
## $ 3pm Temperature (°C) : num 18.5 20.6 24.1 16.3 26.6 19.1 22.3 20.8 26.1 29 ...  
## $ 3pm relative humidity (%) : int 59 60 60 97 41 76 37 42 35 32 ...  
## $ 3pm cloud amount (oktas) : int 8 8 8 8 2 7 3 7 1 8 ...  
## $ 3pm wind direction : chr "ESE" "E" "NW" "SSW" ...  
## $ 3pm wind speed (km/h) : chr "17" "17" "17" "13" ...  
## $ 3pm MSL pressure (hPa) : num 1019 1012 1006 1008 1006 ...

Comment for Q1

#Question 2a  
dat=dat[,-c(10)]  
str(dat)

## 'data.frame': 255 obs. of 21 variables:  
## $ : chr "JAN" "JAN" "JAN" "JAN" ...  
## $ Date : chr "2021-01-1" "2021-01-2" "2021-01-3" "2021-01-4" ...  
## $ Minimum temperature (°C) : num 14.4 13 15.7 14.6 14.1 13 8.3 8.2 7.1 10.7 ...  
## $ Maximum temperature (°C) : num 19.7 22.3 26.7 24.8 28 24.7 24.3 22.2 27.7 31.8 ...  
## $ Rainfall (mm) : num 0 0 5.8 7.2 5.4 0.2 0 0 0 0 ...  
## $ Evaporation (mm) : logi NA NA NA NA NA NA ...  
## $ Sunshine (hours) : logi NA NA NA NA NA NA ...  
## $ Direction of maximum wind gust : chr "ESE" "E" "NNW" "WNW" ...  
## $ Speed of maximum wind gust (km/h): int 35 37 31 56 39 46 44 39 31 37 ...  
## $ 9am Temperature (°C) : num 15.9 16.9 17.9 21.6 19.2 18.2 16.6 15.5 17.3 19.9 ...  
## $ 9am relative humidity (%) : int 71 59 94 74 77 68 57 61 61 60 ...  
## $ 9am cloud amount (oktas) : int 8 8 8 7 4 8 NA 8 NA NA ...  
## $ 9am wind direction : chr "SE" "E" NA "W" ...  
## $ 9am wind speed (km/h) : chr "17" "7" "Calm" "6" ...  
## $ 9am MSL pressure (hPa) : num 1022 1016 1008 1006 1008 ...  
## $ 3pm Temperature (°C) : num 18.5 20.6 24.1 16.3 26.6 19.1 22.3 20.8 26.1 29 ...  
## $ 3pm relative humidity (%) : int 59 60 60 97 41 76 37 42 35 32 ...  
## $ 3pm cloud amount (oktas) : int 8 8 8 8 2 7 3 7 1 8 ...  
## $ 3pm wind direction : chr "ESE" "E" "NW" "SSW" ...  
## $ 3pm wind speed (km/h) : chr "17" "17" "17" "13" ...  
## $ 3pm MSL pressure (hPa) : num 1019 1012 1006 1008 1006 ...

head(dat)

## Date Minimum temperature (°C) Maximum temperature (°C) Rainfall (mm)  
## 1 JAN 2021-01-1 14.4 19.7 0.0  
## 2 JAN 2021-01-2 13.0 22.3 0.0  
## 3 JAN 2021-01-3 15.7 26.7 5.8  
## 4 JAN 2021-01-4 14.6 24.8 7.2  
## 5 JAN 2021-01-5 14.1 28.0 5.4  
## 6 JAN 2021-01-6 13.0 24.7 0.2  
## Evaporation (mm) Sunshine (hours) Direction of maximum wind gust   
## 1 NA NA ESE  
## 2 NA NA E  
## 3 NA NA NNW  
## 4 NA NA WNW  
## 5 NA NA NW  
## 6 NA NA ESE  
## Speed of maximum wind gust (km/h) 9am Temperature (°C)  
## 1 35 15.9  
## 2 37 16.9  
## 3 31 17.9  
## 4 56 21.6  
## 5 39 19.2  
## 6 46 18.2  
## 9am relative humidity (%) 9am cloud amount (oktas) 9am wind direction  
## 1 71 8 SE  
## 2 59 8 E  
## 3 94 8 <NA>  
## 4 74 7 W  
## 5 77 4 W  
## 6 68 8 SE  
## 9am wind speed (km/h) 9am MSL pressure (hPa) 3pm Temperature (°C)  
## 1 17 1021.7 18.5  
## 2 7 1015.7 20.6  
## 3 Calm 1008.1 24.1  
## 4 6 1006.3 16.3  
## 5 9 1008.0 26.6  
## 6 11 1014.0 19.1  
## 3pm relative humidity (%) 3pm cloud amount (oktas) 3pm wind direction  
## 1 59 8 ESE  
## 2 60 8 E  
## 3 60 8 NW  
## 4 97 8 SSW  
## 5 41 2 NW  
## 6 76 7 ESE  
## 3pm wind speed (km/h) 3pm MSL pressure (hPa)  
## 1 17 1019.1  
## 2 17 1011.7  
## 3 17 1005.8  
## 4 13 1007.6  
## 5 20 1006.2  
## 6 33 1013.4

dim(dat)

## [1] 255 21

Comment Q2

Comment Q2